

IN THE SPECIFICATION:

Please replace the paragraph beginning on page 3, line 10 and ending on page 4, line 13 with the following amended paragraph:

The invention is best understood from the following detailed description when read in connection with the accompanying drawing. It is emphasized that, according to common practice in the semiconductor industry, the various features of the drawing are not to scale. On the contrary, the dimensions of the various features are arbitrarily expanded or reduced for clarity. Included in the drawing are the following figures:

Fig. 1 is a perspective view of a dielectric comprising two conductors and having applied thereon a hardmask and a first photoresist for one embodiment of the invention;

Fig. 2 is a perspective and cut-away view of the above embodiment wherein the first photoresist has had an opening for etching a trench photodefined therein;

Fig. 3 is a perspective view of the above embodiment wherein the hardmask has been etched through and the dielectric has been partially etched through to form a trench;

Fig. 4 is a perspective view of the above embodiment wherein the first photoresist has been removed;

Fig. 5A is a perspective view of the: above embodiment wherein a second photoresist has been applied;

Fig. 5B is a section of Fig 5A;

Fig. 6A is a perspective view of the above embodiment wherein the second photoresist has had slits across the trench photodefined therein;

Fig. 6B is a section of Fig 6A;

Fig. 7B is a section of Fig. 7A;

Fig. 7C is a section of Fig 7A;

Fig. 7D is a plan view of Fig. 7 A;

~~Fig. 8A is a perspective view of the above embodiment after metallization and planarization that has removed the second photoresist and the hardmask; and~~

~~Fig. 8B is a section of Fig. 8A.~~

Fig. ~~9A~~8A is a perspective view of the above embodiment after metallization and planarization that has removed the second photoresist, the hardmask and some of the dielectric; and

Fig. ~~9B~~8B is a section of Fig. ~~9~~8A.

Please replace the paragraph beginning on page 5, line 1 and ending on page 5, line 23 with the following amended paragraph:

Referring now to the drawing, wherein like reference numerals refer to like elements throughout, Fig. 1 is-a-shows an perspective view of a dielectric 1, such as silicon dioxide, having two conductors 3 and 5, made of a conductive material such as such as copper, and having applied thereon a hardmask 7, such as silicon nitride and a first photoresist 9 in an exemplary embodiment of the invention. The first photoresist next has a first elongated opening or slit 11 for etching a trench photodefined therein, as shown in Fig. 2. The silicon nitride dielectric is then etched through and the silicon dioxide dielectric is partially etched, "partially" meaning not etched all the way down to conductive materials 3 and 5, through to deepen the first elongated opening 11 to form a trench 13, as shown in Fig. 3. The first photoresist 9 is removed, as shown in Fig. 4, and a second photoresist 15 is applied, as shown in Figs. 5A and 5B. The second photoresist is patterned to form a second set of

elongated openings 17 and 19 across the trench 13, as shown in Figs. 6A, 6B and 6C. Note that the plan view, Fig. 6C, shows the square cross-section of silicon dioxide exposed for etching. Etching that is selective for the silicon dioxide dielectric 1, but not for the silicon nitride hardmask 7 or photoresist 15, causes the formation of square third openings 18 and 20 from the bottom of the trench 13 to the top of the conductors 3 and 5, as shown in Figs. 7A, 7B, 7C and 7D. Figs. 8A and 8B show the structure after metallization, which fills the third openings 18 and 20, and then planarization to remove the second photoresist, hard mask and excess metal, producing the desired square connections such as vias or contacts ~~21-23~~ and ~~22-25~~. A via provides connection between levels, while a contact may be a bond pad, or be topped with a bond pad, for wire bonding and the like. Conductors 3 and 5 may be made of the same or different conductive material as vias or contacts ~~21-23~~ and ~~22-25~~.

Please replace the paragraph beginning on page 5, line 28 and ending on page 6, line 11 with the following amended paragraph:

The process of the present invention includes using a hardmask and a photoresist to define the contact and via after fabricating an oxide trench with a dual damascene process. After the trench etch, instead of defining the contact or via as a round hole as is done conventionally, a slit is printed traversing the dielectric trench with the width of contact or via design rule. Another dimension of the contact or via is defined by the width of the trench. Since the intersection of the slit width and the width of the trench can occur anywhere on the length of the slit, the process of the present invention is self-aligning in the dimension of the slit. This solves the problem of alignment in at least one direction because one mask can be slid along the direction of its elongated opening, but the opening that is defined by its intersection with the elongated opening in the other mask will remain in the same place. Then, a high selectivity (with respect to hard mask and photo resist) anisotropic dielectric etch process is used to define the contact or via down to the previous conductive material level. The slit is preferably transverse and perpendicular to the trench, but it may be any angle so long as the slit is not parallel to the trench. The cross-section shape of the via defined by the intersection of the trench and the slit is generally that of a quadrilateral. The shape will be square if the slit and trench are of equal width, rectangular if they are not and a parallelogram or rhomboid if the slit is not

perpendicular to the trench. In this way, contact area is maximized as compared to more circular cross- sections. The feature size of quadrilateral vias and contacts of the present invention are 0.5 micron and below; 0.25 is preferred and 0.18 to 0.16 and 0.14 are particularly preferred, even 0.12 micron and smaller is possible.